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PATENT ABSTRACTS OF JAPAN

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(71)Applicant : NIPPONDENSO CO LTD

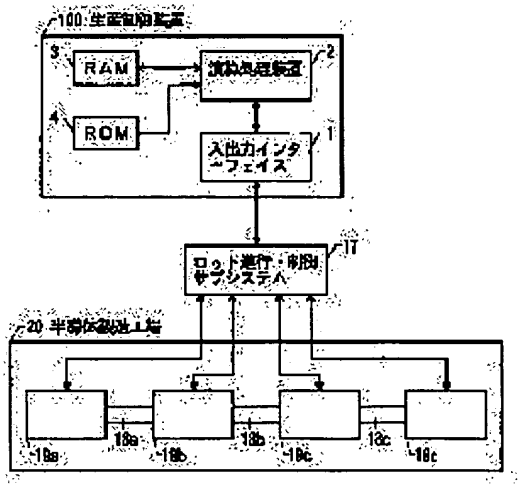
(72)Inventor : OKUMURA HISAHIRO
TAKAHASHI MASATO
IKEDA JUNJI

(54) PRODUCTION CONTROLLER

(57)Abstract:

PURPOSE: To secure the matching between the actual work progress information and the calculation result of a starting job.

CONSTITUTION: A semiconductor production plant 20 includes the manufacture devices 19a to 19d and the carrier paths 18a to 18c which connect the devices 19a to 19d together. The work progress information of each of the manufacture devices 19a to 19d is outputted to a lot progress/control subsystem 17, and the control signals of devices 19a to 19d are inputted from the subsystem 17. A production controller 100 includes an input/output interface 1 which inputs and outputs data to and from the subsystem 17, a ROM 4 which stores a control program, a rewritable RAM 3 which stores the momentary work progress information, a production plan, etc., received from the interface 1, and an arithmetic processor 2 which produces a work program and calculates a starting job based on the data stored in the RAM 3 and the program stored in the ROM 4.



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CLAIMS

[Claim(s)]
[Claim 1] The storage which memorizes the process flow which described the process sequence and the contents of a process of a routing, Lot advance / control subsystem which performs advance management of a lot and control of various equipments based on said process flow is used. A start job calculation means to be the production control device which forms two or more products through two or more routings, to compute a start job based on a work plan, and to direct this start job to said various equipments, A renewal means of activity progress information to update the activity progress information on said process according to the progress situation of said start job computed by said start job calculation means, A notice means of an updating halt to output the updating stop signal for stopping renewal of said activity progress information by said renewal means of activity progress information, The production control unit characterized by having an activity progress information gathering means to collect said activity progress information, and a work-plan generation means to draw up said work plan from said said activity progress information and production planning which were collected.
[Claim 2] Said start job calculation means is a production control unit according to claim 1 characterized by computing said start job with a fixed time interval, and outputting said start job to said renewal means of activity progress information after predetermined time.
[Claim 3] It is the production control unit according to claim 1 characterized by said activity progress information gathering means collecting said activity progress information after said renewal means of activity progress information stops renewal of said activity progress information with the output of said updating stop signal by said notice means of an updating halt.
[Claim 4] It is the production control unit according to claim 1 characterized by performing the output of said updating stop signal by said notice means of an updating halt with a predetermined time interval.
[Claim 5] Said production control unit is a production control unit according to claim 1 characterized by having further an updating halt preliminary announcement means to announce beforehand the notice of a halt of renewal of said activity progress information.
[Claim 6] Said updating halt preliminary announcement means is a production control unit according to claim 5 characterized by suspending initiation of calculation of said new start job by said start job calculation means.
[Claim 7] Said updating halt preliminary announcement means is a production control unit according to claim 5 characterized by warning about 1 minute of the output of said updating stop signal thru/or 15 quotas by said notice means of an updating halt.
[Claim 8] Until the notice of a halt of renewal of said activity progress information is announced beforehand from said updating halt preliminary announcement means to said start job calculation means Calculate said start job with a fixed time interval, and said start job is notified to said renewal means of activity progress information after predetermined time amount. When the notice of an updating halt of said activity progress information is announced beforehand before count termination of said start job The production control unit according to claim 5 characterized by newly not calculating said start job after the time of day when count was then continued at, the count result was notified to said renewal means of activity progress information at, and the notice of an updating halt of said activity progress information was announced beforehand.
[Claim 9] Said renewal means of activity progress information is the production control unit according to claim 5 carry out stopping renewal of said activity progress information after continuing renewal of said activity progress information and outputting said updating stop signal from said notice means of an updating halt, even if the notice of a halt of renewal of said activity progress information was announced beforehand from said updating halt preliminary announcement means as the description.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the production control unit applied to the production process for manufacturing a product through two or more routings.
[0002]
[Description of the Prior Art] Conventionally, some which are indicated by JP,4-270459,A etc. are one of things about the production control unit applied to a production process. As shown in drawing 5 , the production control device 200 currently indicated by JP,4-270459,A consists of the production situation receiving means 51, a job priority calculation means 52, a start job calculation means 53, and a start job calculation result transmitting means 54.
[0003] With this equipment 200, production planning 55, the activity progress information 56, the facility operation information 57, and the facility operation hysteresis information 58 are first received in the production situation receiving means 51. Next, in consideration of the facility system operating status of the whole production system, the progress situation of a job, etc., the job priority 60 according to each production situation at the time is dynamically updated with the job priority calculation means 52 based on production situation data and basic intelligence 59, such as production planning 55 and the activity progress information 56. Furthermore, when processing is completed with a certain facility in a production system and a facility is vacant with the start job calculation means 53, in consideration of the processing effectiveness in the priority and facility, the start job 61 which should be processed with the facility next is determined.
[0004]
[Problem(s) to be Solved by the Invention] However, with the indication technique shown above, since a certain amount of time amount is usually needed for collection of the activity progress information 56, and calculation of a job priority 60, when there are many amounts of the data dealt with especially, the target processing is started during calculation of a job priority 60, and after ending, there is a problem that a difference arises in an actual activity progress situation and the calculation result of a job priority 60, further.
[0005] Therefore, while computing a job priority, the purpose of this invention is offering the production control unit an actual activity progress situation and whose calculation result of a job priority correspond, when the target processing is started and it has ended further.
[0006]
[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the configuration of this invention The storage which memorizes the process flow which described the process sequence and the contents of a process of a routing, Lot advance / control subsystem which performs advance management of a lot and control of various equipments based on a process flow is used. A start job calculation means to be the production control device which forms two or more products through two or more routings, to compute a start job based on a work plan, and to direct this start job to various equipments, A renewal means of activity progress information to update the activity progress information on a process according to the progress situation of the start job computed by the start job calculation means, A notice means of an updating halt to output the updating stop signal for stopping renewal of the activity progress information by the renewal means of activity progress information, It is characterized by having an activity progress information gathering means to collect activity progress information, and a work-plan generation means to draw up a work plan from the collected activity progress information and production planning.
[0007] Moreover, the second configuration of invention is characterized by for a start job calculation means computing a start job with a fixed time interval, and outputting a start job to the renewal means of activity progress information after predetermined time.

[0008] After the renewal means of activity progress information stops renewal of activity progress information with the output of the updating stop signal according [the third configuration of invention] to the notice means of an updating halt, it carries out that an activity progress information gathering means collects activity progress information as the description.
[0009] The fourth configuration of invention is characterized by performing the output of the updating stop signal by the notice means of an updating halt with a predetermined time interval.
[0010] The fifth configuration of invention is characterized by equipping a production control unit with an updating halt preliminary announcement means to announce beforehand the notice of a halt of renewal of activity progress information, further.
[0011] The sixth configuration of invention is characterized by an updating halt preliminary announcement means suspending initiation of calculation of the new start job by the start job calculation means.
[0012] The seventh configuration of invention is characterized by an updating halt preliminary announcement means warning about 1 minute of the output of an updating stop signal thru/or 15 quotas by the notice means of an updating halt.
[0013] The eighth configuration of invention a start job calculation means Until the notice of a halt of renewal of activity progress information is announced beforehand from an updating halt preliminary announcement means Calculate a start job with a fixed time interval, and a start job is notified to the renewal means of activity progress information after predetermined time amount. When the notice of an updating halt of activity progress information is announced beforehand before count termination of a start job Count is then continued, the count result is notified to the renewal means of activity progress information, and it is characterized by newly not calculating a start job after the time of day when the notice of an updating halt of activity progress information was announced beforehand.
[0014] In the renewal means of activity progress information, even if the notice of a halt of renewal of activity progress information is announced beforehand from an updating halt preliminary announcement means, the configuration of invention of the ninth carries out stopping renewal of activity progress information as the description, after continuing renewal of activity progress information and outputting an updating stop signal from the notice means of an updating halt.
[0015]
[Function and Effect] The storage which memorizes the process flow the first operation of this invention which consists of the above-mentioned configuration described the process sequence and the contents of a process of a routing to be, Lot advance / control subsystem which performs advance management of a lot and control of various equipments based on a process flow is used. A start job calculation means to be the production control device which forms two or more products through two or more routings, to compute a start job based on a work plan, and to direct this start job to various equipments, A renewal means of activity progress information to update the activity progress information on a process according to the progress situation of the start job computed by the start job calculation means, A notice means of an updating halt to output the updating stop signal for stopping renewal of the activity progress information by the renewal means of activity progress information, It is having had an activity progress information gathering means collecting activity progress information, and a work-plan generation means drawing up a work plan from the collected activity progress information and production planning. The effectiveness With the notice means of an updating halt, while drawing up the work plan of a work-plan generation means, renewal of activity progress information can be stopped with the notice means of an updating halt, and generating of the inconsistency between the newly calculated work plan and actual activity progress information can be prevented. (Claim 1)
[0016] Moreover, the second operation is that a start job calculation means computes a start job with a fixed time interval, and outputs a start job to the renewal means of activity progress information after predetermined time, the effectiveness does not have nonuniformity in calculation of a start job, and the stable output can be performed. (Claim 2)
[0017] After the renewal means of activity progress information stopping renewal of activity progress information in the third operation by the output of the updating stop signal by the notice means of an updating halt, in an activity progress information gathering means, it is collecting activity progress information and a difference is not generated [effectiveness / the] to the activity progress information at the time of collection, and actual progress information. (Claim 3)
[0018] The fourth operation is that the output of the updating stop signal by the notice means of an updating halt is performed with a predetermined time interval, and the effectiveness can stop renewal of activity progress information without nonuniformity. (Claim 4)
[0019] The fifth operation having been equipped with an updating halt preliminary announcement means a production

control unit announcing beforehand the notice of a halt of renewal of activity progress information further, and its effectiveness can update smoother activity progress information by the preliminary announcement of an updating halt of activity progress information. (Claim 5)
[0020] The sixth operation is that an updating halt preliminary announcement means suspends initiation of calculation of the new start job by the start job calculation means, and the effectiveness can announce beforehand an updating halt of activity progress information easily. (Claim 6)
[0021] The seventh operation is that an updating halt preliminary announcement means warns about 1 minute of the output of an updating stop signal thru/or 15 quotas by the notice means of an updating halt, and the effectiveness can make calculation of a start job complete from the preliminary announcement of an updating halt before the notice of an updating halt, and it is more effective in it. (Claim 7)
[0022] The eighth operation until the notice of a halt of renewal of activity progress information is announced beforehand from an updating halt preliminary announcement means to a start job calculation means Calculate a start job with a fixed time interval, and a start job is notified to the renewal means of activity progress information after predetermined time amount. When the notice of an updating halt of activity progress information is announced beforehand before count termination of a start job Continue count then and the count result is notified to the renewal means of activity progress information. It is newly not calculating a start job after the time of day when the notice of an updating halt of activity progress information was announced beforehand, and renewal of activity progress information can stop the effectiveness after calculation of a start job, and the situation that the updating is not performed can be prevented. (Claim 8)
[0023] Even if the notice of a halt of renewal of activity progress information is announced beforehand from an updating halt preliminary announcement means, the renewal means of activity progress information the ninth operation It is stopping renewal of activity progress information, after continuing renewal of activity progress information and outputting an updating stop signal from the notice means of an updating halt. The effectiveness It can carry out certainly, without being able to stop updating and making renewal of activity progress information finish on the way, after updating the activity progress information under updating. (Claim 9)
[0024]
[Example] this invention person etc. came research in piles wholeheartedly to the above-mentioned technical problem. Consequently, before preceding starting a work plan and collecting activity progress information with an activity progress information gathering means, it was able to clarify that it is in agreement in an actual activity progress situation and a job priority calculation result by notifying a halt of renewal of activity progress information to the renewal means of activity progress information. Hereafter, this invention is explained based on a concrete example.
[0025] Drawing 1 is the block diagram having shown the relation between the production control unit 100 and a semi-conductor plant in the hardware configuration list of the production control unit 100 in the first example of this invention. The semi-conductor plant 20 consists of the conveyance ways 18a-18c which connect manufacturing installations 19a-19d and each manufacturing installation 19a-19d, and each manufacturing installations [19a-19d] activity progress information is outputted to lot advance / control subsystem 17, and an each manufacturing installations [19a-19d] control signal is inputted from lot advance / control subsystem 17.
[0026] The input/output interface 1 with which the production control device 100 outputs and inputs data with lot advance / control subsystem 17, Activity progress information, production planning, etc. of **** are sometimes memorized. ROM4 the control program was remembered to be was inputted from the input/output interface 1 -- with rewritable RAM3 Based on the program memorized by ROM4, a work plan is drawn up using the data memorized by RAM3, and it consists of processing units 2 which compute a start job.
[0027] Next, RAM3 in the production control unit 100 and the detail of a processing unit 2 are explained using drawing 2 . While a processing unit 2 computes a start job and directing start of a job to each manufacturing installations 19a-19d The start job calculation section 11 (equivalent to a start job calculation means) which notifies start of a job to the renewal section 15 of activity progress information, The renewal section 15 (equivalent to the renewal means of activity progress information) of activity progress information which updates process activity progress information according to the progress situation of the start job computed by the start job calculation section 11, The notice section 12 (equivalent to the notice means of an updating halt) of an updating halt which notifies a halt of renewal of process activity progress information, The activity progress information gathering section 14 (equivalent to an activity progress information gathering means) which collects the process activity progress information 31, The work-plan generation section 16 (equivalent to a work-plan generation means) which draws up a work plan by the whole activity progress information collected in the activity progress information gathering section 14, and production planning, It consists of the updating halt preliminary announcement sections 13 (equivalent to an updating halt preliminary announcement means) which

notify the preliminary announcement of an updating halt to 1 minute of an updating halt thru/or 15 quotas to the start job calculation section 11.

[0028] RAM3 Moreover, the process activity progress information storage section 31 of each process activity which sometimes memorizes the progress information on ****, The whole activity progress information storage section 32 which memorizes the activity progress information on the whole collected in the activity progress information gathering section 14, It consists of the production-planning storage section 34 which memorizes production planning beforehand determined as the process flow storage section 33 which memorizes the process flow which described the process sequence and the contents of a process of a routing, and the work-plan storage section 35 which memorizes the work plan drawn up in the work-plan generation section 16. The production-planning data memorized by the data and the production-planning storage section 34 of an activity progress situation which are memorized by the process activity progress information storage section 31 among the above are a configuration as shown in drawing 4 R> 4 (a) and (b), respectively.

[0029] The procedure of the production control device 100 which consists of the above-mentioned configuration is explained using the flow chart of drawing 3 . First, the start job was computed at the start job calculation section 11 (step 210), when the updating halt preliminary announcement signal from the updating halt preliminary announcement section 13 was, it judged as YES at step 220, and it progressed to step 230, and initiation of calculation of a new start job was carried out as the configuration [stop] by which this updating halt preliminary announcement signal is outputted in addition to five quotas of a notice of an updating halt by this example.

[0030] After a halt of this start job calculation initiation, the start job calculation section 11 notifies the start job computed by the renewal section 15 of activity progress information in the start job calculation section 11, while notifying the calculation result of the start job started in calculation to lot advance / control subsystem 17, before an updating halt preliminary announcement signal receives (step 240). If a start job is notified, lot advance / control subsystem 17 directs initiation of a start job to each manufacturing installations 19a-19d (step 250).

[0031] Then, in the renewal section 15 of activity progress information, the activity progress information memorized by the process activity progress information storage section 31 is updated (step 260). After renewal of this activity progress information, when there is an updating stop signal from the notice section 12 of an updating halt, it is judged with YES at step 270, and it progresses to step 280, and renewal of activity progress information is stopped in the renewal section 15 of activity progress information. In the activity progress information gathering section 14, activity progress information is collected after a halt of renewal of activity progress information (step 290).

[0032] Then, based on the activity progress information that the above was updated, a work plan is drawn up in the work-plan generation section 16 (step 300), a work plan is outputted to the start job calculation section 11 (step 310), calculation of return and a start job is performed to step 210, and the same processing as the following is performed. In the above-mentioned step 220, when it is judged with NO and it progresses to step 240, when there is no updating halt preliminary announcement signal from the updating halt preliminary announcement section 13, and there is no updating stop signal from the notice section 12 of an updating halt in step 270, it is judged with NO and progresses to step 290.

[0033] In the above, the start job calculation section 11 shall compute a start job with a fixed time interval, and shall notify a start job to the renewal section 15 of activity progress information after predetermined time amount until the updating halt preliminary announcement signal from the updating halt preliminary announcement section 13 is notified. Moreover, in step 230, in case initiation of calculation of a new start job is suspended, in being the middle of the start job calculation section 11 being still count of a start job, suppose that count is continued as it is.

[0034] In addition, when it is usual [to which a halt of renewal of activity progress information is not performed], first, since there is no updating stop signal from the notice section 12 of an updating halt, in step 220, it judges with NO after calculation of a start job, at step 210, and progresses to step 240. Then, a start job is notified to lot advance / control subsystem 17 and the renewal section 15 of activity progress information (step 240), and lot advance / control subsystem 17 directs initiation of a start job for initiation of a start job to each manufacturing installations 19a-19d (step 250). Activity progress information is updated in the renewal section 15 of activity progress information after directions of initiation of a start job (step 260), and it is carried out one by one with collection (step 290) of activity progress information, calculation (step 300) of a work plan, and the notice (step 310) of a work plan.

[0035] Since actuation of the renewal section 15 of activity progress information stops after the activity progress information-gathering section 14 starts actuation in this example until a work plan is notified to the start job calculation section 11 as shown above, generating of the inconsistency between the work plan which activity progress information is not updated in the work-plan generation section 16 while drawing up a work plan, and was newly calculated, and actual activity progress information can be prevented.

[0036] Moreover, after notifying an updating halt preliminary announcement from the updating halt preliminary

announcement section 13 While the start job calculation section 11 suspends initiation of calculation of a new start job and the renewal section 15 of activity progress information makes actuation continue By setting so that calculation of a start job may be made to complete before the notice of an updating halt from the notice of an updating halt preliminary announcement, generating of the inconsistency between an actual progress situation and activity progress information can be prevented.

[0037] Namely, by the notice of an updating halt from the notice section 12 of an updating halt, when it does not have the updating halt preliminary announcement section 13, although the start job calculation section 11 stops When calculation of a start job is started before the notice of an updating halt and calculation of a start job has not been completed, the start job computed after arrival of the notice of an updating halt is notified to lot advance / control subsystem 17 and the renewal section 15 of activity progress information. In this case, since the start job of this lot is actually carried out in order that lot advance / control subsystem 17 may not stop although the renewal section 15 of activity progress information has stopped and renewal of the activity progress information on this lot is not carried out Although the problem of generating an inconsistency was between an actual activity progress situation and activity progress information, an actual activity progress situation and activity progress information can be made in agreement by considering as the above-mentioned configuration.

[0038] In addition, although carried out at this example as the configuration the output of the updating halt preliminary announcement signal by the updating halt preliminary announcement section 13 carries out to five quotas of the notice of an updating halt by the notice section 12 of an updating halt, in this invention, it may not be limited to this, and 1 minute thru/or 15 quotas are [that what is necessary is just spacing it is extent it can complete in calculation of a start job] sufficient in spacing of the notice of a preliminary announcement of an updating halt, and the notice of an updating halt.

[0039] In this example, although the semi-conductor plant 20 was constituted from two or more manufacturing installations 19a-19d and two or more conveyance ways 18a-18c, the number of the manufacturing installation and the number of a conveyance way are not limited to this. Moreover, in this example, although the semi-conductor plant 20 was set as the application target of the production control unit 100, this invention is not limited to this and is good also considering plants, such as a liquid crystal display, as a candidate for application.

[0040] By stopping actuation of the renewal means of activity progress information until a work-plan generation means notifies a work plan from the time of initiation of actuation of an activity progress information gathering means to a start job calculation means according to this invention, as shown above Generating of the inconsistency between the work plan which activity progress information is not updated with a work-plan generation means while drawing up a work plan, and was newly calculated, and actual activity progress information can be prevented. Moreover, after notifying an updating halt preliminary announcement from an updating halt preliminary announcement means, a start job calculation means stops initiation of calculation of a new start job, and while the renewal means of activity progress information makes actuation continue, it can prevent generating of the inconsistency between an actual progress situation and activity progress information by setting so that calculation of a start job may make complete before the notice of an updating halt from the notice of an updating halt preliminary announcement.

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TECHNICAL FIELD

[Industrial Application] This invention relates to the production control unit applied to the production process for manufacturing a product through two or more routings.

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PRIOR ART

[Description of the Prior Art] Conventionally, some which are indicated by JP,4-270459,A etc. are one of things about the production control unit applied to a production process. As shown in drawing 5 , the production control device 200 currently indicated by JP,4-270459,A consists of the production situation receiving means 51, a job priority calculation means 52, a start job calculation means 53, and a start job calculation result transmitting means 54.
[0003] With this equipment 200, production planning 55, the activity progress information 56, the facility operation information 57, and the facility operation hysteresis information 58 are first received in the production situation receiving means 51. Next, in consideration of the facility system operating status of the whole production system, the progress situation of a job, etc., the job priority 60 according to each production situation at the time is dynamically updated with the job priority calculation means 52 based on production situation data and basic intelligence 59, such as production planning 55 and the activity progress information 56. Furthermore, when processing is completed with a certain facility in a production system and a facility is vacant with the start job calculation means 53, in consideration of the processing effectiveness in the priority and facility, the start job 61 which should be processed with the facility next is determined.

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EFFECT OF THE INVENTION

[Function and Effect] The storage which memorizes the process flow the first operation of this invention which consists of the above-mentioned configuration described the process sequence and the contents of a process of a routing to be, Lot advance / control subsystem which performs advance management of a lot and control of various equipments based on a process flow is used. A start job calculation means to be the production control device which forms two or more products through two or more routings, to compute a start job based on a work plan, and to direct this start job to various equipments, A renewal means of activity progress information to update the activity progress information on a process according to the progress situation of the start job computed by the start job calculation means, A notice means of an updating halt to output the updating stop signal for stopping renewal of the activity progress information by the renewal means of activity progress information, It is having had an activity progress information gathering means collecting activity progress information, and a work-plan generation means drawing up a work plan from the collected activity progress information and production planning. The effectiveness With the notice means of an updating halt, while drawing up the work plan of a work-plan generation means, renewal of activity progress information can be stopped with the notice means of an updating halt, and generating of the inconsistency between the newly calculated work plan and actual activity progress information can be prevented. (Claim 1)
[0016] Moreover, the second operation is that a start job calculation means computes a start job with a fixed time interval, and outputs a start job to the renewal means of activity progress information after predetermined time, the effectiveness does not have nonuniformity in calculation of a start job, and the stable output can be performed. (Claim 2)
[0017] After the renewal means of activity progress information stopping renewal of activity progress information in the third operation by the output of the updating stop signal by the notice means of an updating halt, in an activity progress information gathering means, it is collecting activity progress information and a difference is not generated [effectiveness / the] to the activity progress information at the time of collection, and actual progress information. (Claim 3)
[0018] The fourth operation is that the output of the updating stop signal by the notice means of an updating halt is performed with a predetermined time interval, and the effectiveness can stop renewal of activity progress information without nonuniformity. (Claim 4)
[0019] The fifth operation having been equipped with an updating halt preliminary announcement means a production control unit announcing beforehand the notice of a halt of renewal of activity progress information further, and its effectiveness can update smoother activity progress information by the preliminary announcement of an updating halt of activity progress information. (Claim 5)
[0020] The sixth operation is that an updating halt preliminary announcement means suspends initiation of calculation of the new start job by the start job calculation means, and the effectiveness can announce beforehand an updating halt of activity progress information easily. (Claim 6)
[0021] The seventh operation is that an updating halt preliminary announcement means warns about 1 minute of the output of an updating stop signal thru/or 15 quotas by the notice means of an updating halt, and the effectiveness can make calculation of a start job complete from the preliminary announcement of an updating halt before the notice of an updating halt, and it is more effective in it. (Claim 7)
[0022] The eighth operation until the notice of a halt of renewal of activity progress information is announced beforehand from an updating halt preliminary announcement means to a start job calculation means Calculate a start job with a fixed time interval, and a start job is notified to the renewal means of activity progress information after predetermined time amount. When the notice of an updating halt of activity progress information is announced beforehand before count termination of a start job Continue count then and the count result is notified to the renewal

means of activity progress information. It is newly not calculating a start job after the time of day when the notice of an updating halt of activity progress information was announced beforehand, and renewal of activity progress information can stop the effectiveness after calculation of a start job, and the situation that the updating is not performed can be prevented. (Claim 8)

[0023] Even if the notice of a halt of renewal of activity progress information is announced beforehand from an updating halt preliminary announcement means, the renewal means of activity progress information the ninth operation It is stopping renewal of activity progress information, after continuing renewal of activity progress information and outputting an updating stop signal from the notice means of an updating halt. The effectiveness It can carry out certainly, without being able to stop updating and making renewal of activity progress information finish on the way, after updating the activity progress information under updating. (Claim 9)

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, with the indication technique shown above, since a certain amount of time amount is usually needed for collection of the activity progress information 56, and calculation of a job priority 60, when there are many amounts of the data dealt with especially, the target processing is started during calculation of a job priority 60, and after ending, there is a problem that a difference arises in an actual activity progress situation and the calculation result of a job priority 60, further.
[0005] Therefore, while computing a job priority, the purpose of this invention is offering the production control unit an actual activity progress situation and whose calculation result of a job priority correspond, when the target processing is started and it has ended further.

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MEANS

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, the configuration of this invention The storage which memorizes the process flow which described the process sequence and the contents of a process of a routing, Lot advance / control subsystem which performs advance management of a lot and control of various equipments based on a process flow is used. A start job calculation means to be the production control device which forms two or more products through two or more routings, to compute a start job based on a work plan, and to direct this start job to various equipments, A renewal means of activity progress information to update the activity progress information on a process according to the progress situation of the start job computed by the start job calculation means, A notice means of an updating halt to output the updating stop signal for stopping renewal of the activity progress information by the renewal means of activity progress information, It is characterized by having an activity progress information gathering means to collect activity progress information, and a work-plan generation means to draw up a work plan from the collected activity progress information and production planning.
[0007] Moreover, the second configuration of invention is characterized by for a start job calculation means computing a start job with a fixed time interval, and outputting a start job to the renewal means of activity progress information after predetermined time.
[0008] After the renewal means of activity progress information stops renewal of activity progress information with the output of the updating stop signal according [the third configuration of invention] to the notice means of an updating halt, it carries out that an activity progress information gathering means collects activity progress information as the description.
[0009] The fourth configuration of invention is characterized by performing the output of the updating stop signal by the notice means of an updating halt with a predetermined time interval.
[0010] The fifth configuration of invention is characterized by equipping a production control unit with an updating halt preliminary announcement means to announce beforehand the notice of a halt of renewal of activity progress information, further.
[0011] The sixth configuration of invention is characterized by an updating halt preliminary announcement means suspending initiation of calculation of the new start job by the start job calculation means.
[0012] The seventh configuration of invention is characterized by an updating halt preliminary announcement means warning about 1 minute of the output of an updating stop signal thru/or 15 quotas by the notice means of an updating halt.
[0013] The eighth configuration of invention a start job calculation means Until the notice of a halt of renewal of activity progress information is announced beforehand from an updating halt preliminary announcement means Calculate a start job with a fixed time interval, and a start job is notified to the renewal means of activity progress information after predetermined time amount. When the notice of an updating halt of activity progress information is announced beforehand before count termination of a start job Count is then continued, the count result is notified to the renewal means of activity progress information, and it is characterized by newly not calculating a start job after the time of day when the notice of an updating halt of activity progress information was announced beforehand.
[0014] In the renewal means of activity progress information, even if the notice of a halt of renewal of activity progress information is announced beforehand from an updating halt preliminary announcement means, the configuration of invention of the ninth carries out stopping renewal of activity progress information as the description, after continuing renewal of activity progress information and outputting an updating stop signal from the notice means of an updating halt.

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EXAMPLE

[Example] this invention person etc. came research in piles wholeheartedly to the above-mentioned technical problem. Consequently, before preceding starting a work plan and collecting activity progress information with an activity progress information gathering means, it was able to clarify that it is in agreement in an actual activity progress situation and a job priority calculation result by notifying a halt of renewal of activity progress information to the renewal means of activity progress information. Hereafter, this invention is explained based on a concrete example.
[0025] Drawing 1 is the block diagram having shown the relation between the production control unit 100 and a semi-conductor plant in the hardware configuration list of the production control unit 100 in the first example of this invention. The semi-conductor plant 20 consists of the conveyance ways 18a-18c which connect manufacturing installations 19a-19d and each manufacturing installation 19a-19d, and each manufacturing installations [19a-19d] activity progress information is outputted to lot advance / control subsystem 17, and an each manufacturing installations [19a-19d] control signal is inputted from lot advance / control subsystem 17.
[0026] The input/output interface 1 with which the production control device 100 outputs and inputs data with lot advance / control subsystem 17, Activity progress information, production planning, etc. of **** are sometimes memorized. ROM4 the control program was remembered to be was inputted from the input/output interface 1 -- with rewritable RAM3 Based on the program memorized by ROM4, a work plan is drawn up using the data memorized by RAM3, and it consists of processing units 2 which compute a start job.
[0027] Next, RAM3 in the production control unit 100 and the detail of a processing unit 2 are explained using drawing 2 . While a processing unit 2 computes a start job and directing start of a job to each manufacturing installations 19a-19d The start job calculation section 11 (equivalent to a start job calculation means) which notifies start of a job to the renewal section 15 of activity progress information, The renewal section 15 (equivalent to the renewal means of activity progress information) of activity progress information which updates process activity progress information according to the progress situation of the start job computed by the start job calculation section 11, The notice section 12 (equivalent to the notice means of an updating halt) of an updating halt which notifies a halt of renewal of process activity progress information, The activity progress information gathering section 14 (equivalent to an activity progress information gathering means) which collects the process activity progress information 31, The work-plan generation section 16 (equivalent to a work-plan generation means) which draws up a work plan by the whole activity progress information collected in the activity progress information gathering section 14, and production planning, It consists of the updating halt preliminary announcement sections 13 (equivalent to an updating halt preliminary announcement means) which notify the preliminary announcement of an updating halt to 1 minute of an updating halt thru/or 15 quotas to the start job calculation section 11.
[0028] RAM3 Moreover, the process activity progress information storage section 31 of each process activity which sometimes memorizes the progress information on ****, The whole activity progress information storage section 32 which memorizes the activity progress information on the whole collected in the activity progress information gathering section 14, It consists of the production-planning storage section 34 which memorizes production planning beforehand determined as the process flow storage section 33 which memorizes the process flow which described the process sequence and the contents of a process of a routing, and the work-plan storage section 35 which memorizes the work plan drawn up in the work-plan generation section 16. The production-planning data memorized by the data and the production-planning storage section 34 of an activity progress situation which are memorized by the process activity progress information storage section 31 among the above are a configuration as shown in drawing 4 R> 4 (a) and (b), respectively.
[0029] The procedure of the production control device 100 which consists of the above-mentioned configuration is explained using the flow chart of drawing 3 . First, the start job was computed at the start job calculation section 11

(step 210), when the updating halt preliminary announcement signal from the updating halt preliminary announcement section 13 was, it judged as YES at step 220, and it progressed to step 230, and initiation of calculation of a new start job was carried out as the configuration [stop] by which this updating halt preliminary announcement signal is outputted in addition to five quotas of a notice of an updating halt by this example.
[0030] After a halt of this start job calculation initiation, the start job calculation section 11 notifies the start job computed by the renewal section 15 of activity progress information in the start job calculation section 11, while notifying the calculation result of the start job started in calculation to lot advance / control subsystem 17, before an updating halt preliminary announcement signal receives (step 240). If a start job is notified, lot advance / control subsystem 17 directs initiation of a start job to each manufacturing installations 19a-19d (step 250).
[0031] Then, in the renewal section 15 of activity progress information, the activity progress information memorized by the process activity progress information storage section 31 is updated (step 260). After renewal of this activity progress information, when there is an updating stop signal from the notice section 12 of an updating halt, it is judged with YES at step 270, and it progresses to step 280, and renewal of activity progress information is stopped in the renewal section 15 of activity progress information. In the activity progress information gathering section 14, activity progress information is collected after a halt of renewal of activity progress information (step 290).
[0032] Then, based on the activity progress information that the above was updated, a work plan is drawn up in the work-plan generation section 16 (step 300), a work plan is outputted to the start job calculation section 11 (step 310), calculation of return and a start job is performed to step 210, and the same processing as the following is performed. In the above-mentioned step 220, when it is judged with NO and it progresses to step 240, when there is no updating halt preliminary announcement signal from the updating halt preliminary announcement section 13, and there is no updating stop signal from the notice section 12 of an updating halt in step 270, it is judged with NO and progresses to step 290.
[0033] In the above, the start job calculation section 11 shall compute a start job with a fixed time interval, and shall notify a start job to the renewal section 15 of activity progress information after predetermined time amount until the updating halt preliminary announcement signal from the updating halt preliminary announcement section 13 is notified. Moreover, in step 230, in case initiation of calculation of a new start job is suspended, in being the middle of the start job calculation section 11 being still count of a start job, suppose that count is continued as it is.
[0034] In addition, when it is usual [to which a halt of renewal of activity progress information is not performed], first, since there is no updating stop signal from the notice section 12 of an updating halt, in step 220, it judges with NO after calculation of a start job, at step 210, and progresses to step 240. Then, a start job is notified to lot advance / control subsystem 17 and the renewal section 15 of activity progress information (step 240), and lot advance / control subsystem 17 directs initiation of a start job for initiation of a start job to each manufacturing installations 19a-19d (step 250). Activity progress information is updated in the renewal section 15 of activity progress information after directions of initiation of a start job (step 260), and it is carried out one by one with collection (step 290) of activity progress information, calculation (step 300) of a work plan, and the notice (step 310) of a work plan.
[0035] Since actuation of the renewal section 15 of activity progress information stops after the activity progress information-gathering section 14 starts actuation in this example until a work plan is notified to the start job calculation section 11 as shown above, generating of the inconsistency between the work plan which activity progress information is not updated in the work-plan generation section 16 while drawing up a work plan, and was newly calculated, and actual activity progress information can be prevented.
[0036] Moreover, after notifying an updating halt preliminary announcement from the updating halt preliminary announcement section 13 While the start job calculation section 11 suspends initiation of calculation of a new start job and the renewal section 15 of activity progress information makes actuation continue By setting so that calculation of a start job may be made to complete before the notice of an updating halt from the notice of an updating halt preliminary announcement, generating of the inconsistency between an actual progress situation and activity progress information can be prevented.
[0037] Namely, by the notice of an updating halt from the notice section 12 of an updating halt, when it does not have the updating halt preliminary announcement section 13, although the start job calculation section 11 stops When calculation of a start job is started before the notice of an updating halt and calculation of a start job has not been completed, the start job computed after arrival of the notice of an updating halt is notified to lot advance / control subsystem 17 and the renewal section 15 of activity progress information. In this case, since the start job of this lot is actually carried out in order that lot advance / control subsystem 17 may not stop although the renewal section 15 of activity progress information has stopped and renewal of the activity progress information on this lot is not carried out Although the problem of generating an inconsistency was between an actual activity progress situation and activity progress information, an actual activity progress situation and activity progress information can be made in agreement

by considering as the above-mentioned configuration.
[0038] In addition, although carried out at this example as the configuration the output of the updating halt preliminary announcement signal by the updating halt preliminary announcement section 13 carries out to five quotas of the notice of an updating halt by the notice section 12 of an updating halt, in this invention, it may not be limited to this, and 1 minute thru/or 15 quotas are [that what is necessary is just spacing it is extent it can complete in calculation of a start job] sufficient in spacing of the notice of a preliminary announcement of an updating halt, and the notice of an updating halt.
[0039] In this example, although the semi-conductor plant 20 was constituted from two or more manufacturing installations 19a-19d and two or more conveyance ways 18a-18c, the number of the manufacturing installation and the number of a conveyance way are not limited to this. Moreover, in this example, although the semi-conductor plant 20 was set as the application target of the production control unit 100, this invention is not limited to this and is good also considering plants, such as a liquid crystal display, as a candidate for application.
[0040] By stopping actuation of the renewal means of activity progress information until a work-plan generation means notifies a work plan from the time of initiation of actuation of an activity progress information gathering means to a start job calculation means according to this invention, as shown above Generating of the inconsistency between the work plan which activity progress information is not updated with a work-plan generation means while drawing up a work plan, and was newly calculated, and actual activity progress information can be prevented. Moreover, after notifying an updating halt preliminary announcement from an updating halt preliminary announcement means, a start job calculation means stops initiation of calculation of a new start job, and while the renewal means of activity progress information makes actuation continue, it can prevent generating of the inconsistency between an actual progress situation and activity progress information by setting so that calculation of a start job may make complete before the notice of an updating halt from the notice of an updating halt preliminary announcement.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Structural drawing having shown the configuration of the hardware of the first example concerning this invention.
[Drawing 2] The mimetic diagram having shown the detail of the production control unit of the first example concerning this invention.
[Drawing 3] The flow chart which showed the flow of processing of the work-plan creation time of the first example concerning this invention.
[Drawing 4] The mimetic diagram having shown the configuration of the data (a) showing the activity progress information that it is used in the first example concerning this invention, and the data (b) showing production planning.
[Drawing 5] The block diagram having shown the configuration of the conventional production control unit.
[Description of Notations]
1 Input/output Interface
2 Processing Unit
3 RAM
4 ROM
11 Start Job Calculation Section
12 Notice Section of Updating Halt
13 Updating Halt Preliminary Announcement Section
14 Activity Progress Information Gathering Section
15 Activity Progress Information Gathering Section
16 Work-Plan Generation Section
17 Lot Advance / Control Subsystem
20 Semi-conductor Plant
31 Process Activity Progress Information Storage
32 Whole Activity Progress Information Storage Section
33 Process Flow Storage Section
34 Production-Planning Storage Section
35 Work-Plan Storage Section
100 Production Control Unit

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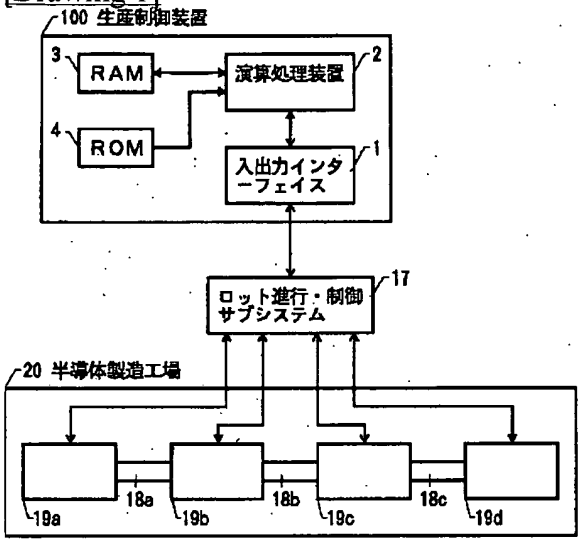
DRAWINGS

[Drawing 1]



19a ～19d：製造装置
18a ～18c：搬送路

[Drawing 4]

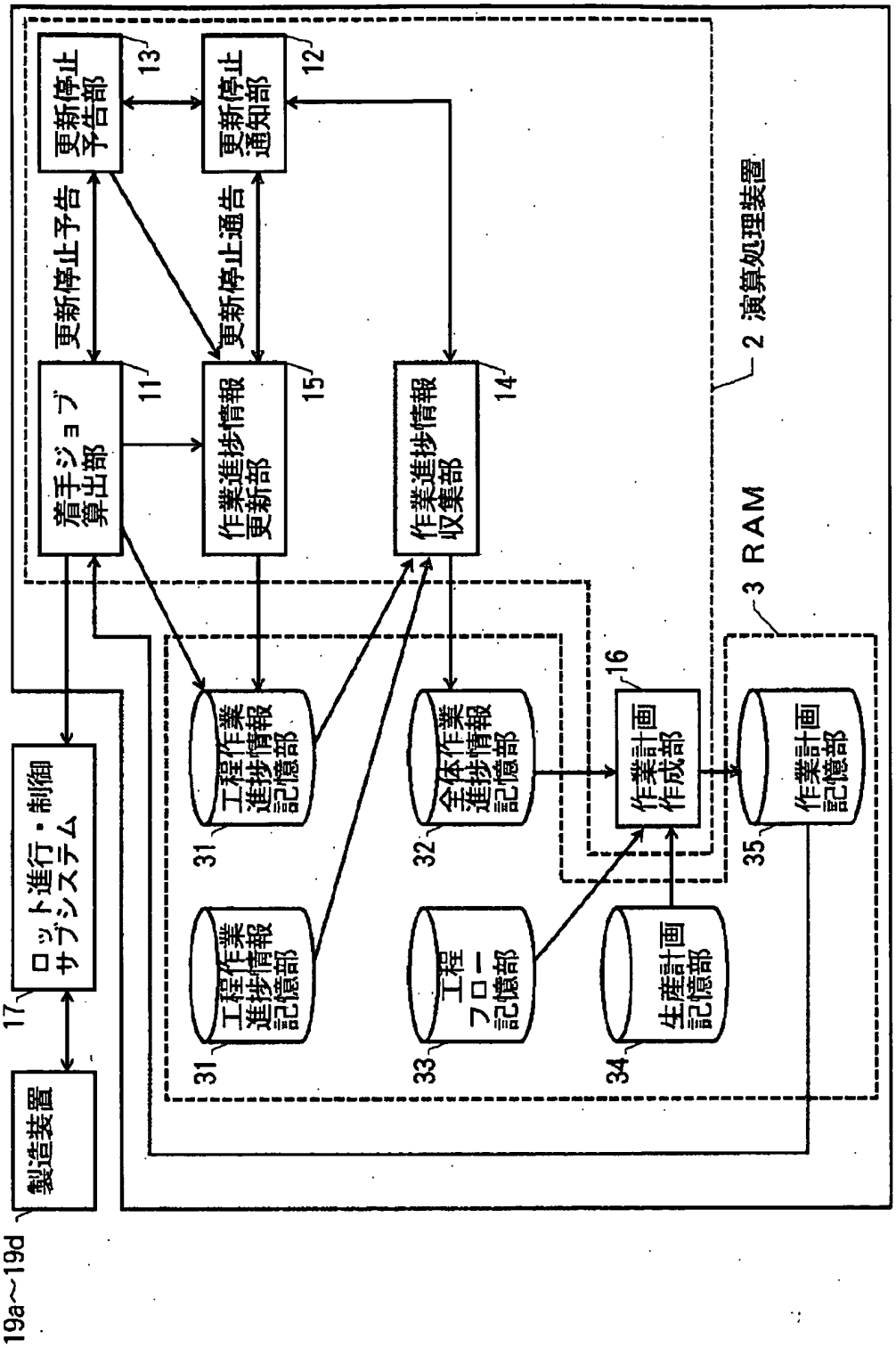
(a) 作業進捗状況データ

ジョブNo.	装置No.	待ち時間	残り作業時間
ジョブ1	19a	1．2	——
ジョブ2	19b	——	0．3
ジョブ3	19c	1．3	——
⋮	⋮	⋮	⋮

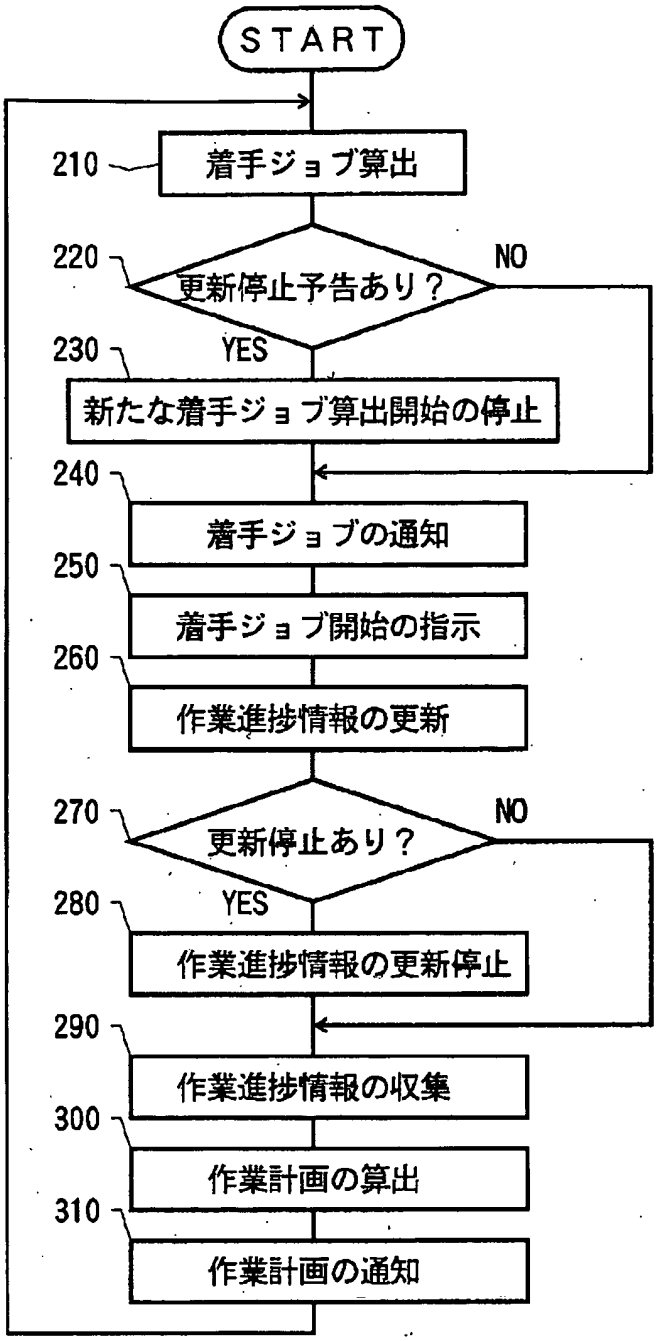
(b) 生産計画データ

ジョブNo.	機種	数量	作業開始	終了予定	納期
ジョブ1	TYP1	10	95/04/01	95/04/08	95/04/30
ジョブ2	TYP2	20	95/04/01	95/04/08	95/04/30
ジョブ3	TYP3	10	95/04/01	95/04/15	95/04/30
⋮	⋮	⋮	⋮	⋮	⋮

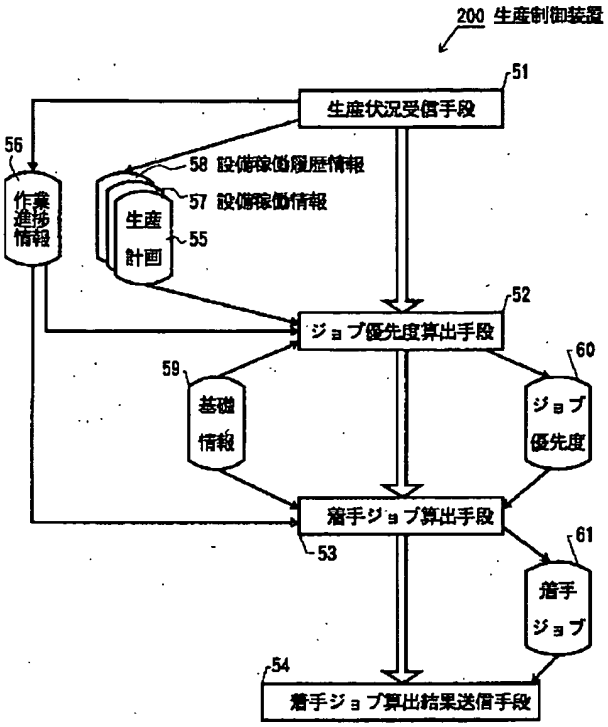
[Drawing 2]


更新停止予告部
13
更新停止通知部
12
更新停止予告
更新停止通告
着手ジョブ算出部
11
作業進捗情報更新部
15
作業進捗情報収集部
14
2 演算処理装置
3 RAM
16
工程作業進捗情報記憶部
31
全体作業進捗情報記憶部
32
作業計画作成部
作業計画記憶部
35
工程作業進捗情報記憶部
31
工程フロー記憶部
33
生産計画記憶部
34
ロボット進行・制御サブシステム
17
製造装置
19a～19d

[Drawing 3]


START
210
着手ジョブ算出
220
更新停止予告あり？
NO
YES
230
新たな着手ジョブ算出開始の停止
240
着手ジョブの通知
250
着手ジョブ開始の指示
260
作業進捗情報の更新
270
更新停止あり？
NO
YES
280
作業進捗情報の更新停止
290
作業進捗情報の収集
300
作業計画の算出
310
作業計画の通知

[Drawing 5]



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